

WHAT IS CLAIMED IS:

1. A very thin fan motor with heat sink attached which is a fan motor mounted in various kinds of electronic equipment that need to radiate heat, for the purpose of using air for a cooling effect;

characterized by having a fan motor mechanism that comprises a heat plate that supports a rotor fan that can rotate in a central position and that has a contact surface that matches the shape of the external surface of the item to be cooled, rotor magnets that are part of the rotor fan and are positioned around the periphery on the surface of the heat plate, and a stator coil substrate;

by having blades of the rotor fan each formed in the same gentle arc, and in the inner portion of the inner/outer two-step multi-blade form of the rotor fan, the blade being set at an angle to move the air through the openings in the direction of rotational thrust toward the air intake, and outward from the central section, the blade angle pushing the air in the radial direction of rotation, which is toward the outer periphery of the rotor fan, and the step that reaches beyond the raised central portion of the heat plate reaching down toward the object being cooled, in such a way that the outer step of the curved blades of the rotor fan is near to the stacked heat radiation fins, the rotor fan with two-step blades being shaped like an inverted saucer;

by having multiple thin metal heat radiation fins with excellent thermal conductivity arranged in parallel at fixed intervals above the heat plate outside the rotor fan as cooling heat-radiation fins;

and by combining the function of cooling heat sink with the heat radiation fins that conduct the heat absorbed from the heat plate and radiate it away by the action of the air moved by the rotor fan.

2. A very thin fan motor with heat sink attached as described in

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claim 1 above, in which multiple heat radiation fins each having an opening large enough to accommodate with adequate turning room a rotor fan, are stacked on the heat plate, an air intake with a diameter smaller than the diameter of the rotor fan being placed over the center of the heat plate, and the coils of a stator unit that is molded of a polymer together with the circuit board around the periphery of the air intake being located facing the heat plate, and the magnets of the rotor unit that includes the supported rotor fan being driven magnetically.

10 3. A very thin fan motor with heat sink attached as described in claim 1 or 2 above, in which multiple heat radiation fins are stacked with a given interval between them and are connected by a heat conducting material or fittings, and in at least two diagonally opposed corners of the multiple heat radiation fins, the heat sink unit and the stator unit are fixed together in a simple assembly process using pressure, bonding, welding or long screws.

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15 4. A very thin fan motor with heat sink attached as described in one of claims 1 through 3 above, in which there is a heat plate formed of a material with excellent thermal conductivity, such as a precious metal or copper, or a material that is partially diamond crystal, and the heat sink assembled on the heat plate is a stack of metal heat radiation fins made of copper or aluminum.

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